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IPO flipping in Australia: cross-sectional explanations

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Abstract

We access electronic share settlement records for each subscriber and aftermarket investor in 419 Australian IPOs to investigate whether initial subscribers flip their allocations, and we relate this flipping behaviour to issuer, shareholder, underwriter and market characteristics. We find that the main determinants are underpricing (consistent with the disposition effect, i.e., a tendency to realise gains before losses), whether the IPO market is "hot" (a proxy for the representativeness heuristic) and ex ante risk characteristics. When flipping is analysed separately for underpriced and overpriced IPOs we find that the most overpriced IPOs are flipped more than the less overpriced ones, a result which contrasts the disposition effect. This result is due to the action of institutional, rather than individual, investors. We also relate flipping activity to the firm's long-run return, and find that the flipping behaviour of large (informed) investors is unrelated to long-run returns, while uninformed investors consistently flip more of the IPOs that have better long-run returns.

JEL classification: G12; G14; G24
Keywords: IPO; Flipping; Underpricing; Cross-sectional explanations

1. Introduction

In recent years there has been increased attention given to studying the aftermarket trading in Initial Public Offerings (IPOs). Most of this research has investigated U.S. IPOs, with the primary focus of these studies being the aftermarket stabilisation activities of underwriters. Flipping (i.e.,

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the sale of shares acquired in an IPO within a short period after listing, this being better known as "stagging" in Australia) has only received limited attention.

Underwriters in the U.S. frequently play a significant role in the aftermarket, standing in as a market maker to provide an initial source of liquidity.[1] In addition, underwriters often stabilise the aftermarket through net buying in order to offset the downward price pressure from flipping, particularly in weak offerings (see Carter and Dark (1993)).

The cost that flipping imposes on U.S. underwriters is potentially high. Significant inventory risks can be accumulated when an offering is poorly received. In addition, underwriters also risk inventory losses arising from reselling flipped shares in a declining market. Correra (1992) highlights that underwriters attempt to vigorously deter flipping. He suggests that underwriters are at "war against IPO flippers" noting that it is the "aim of underwriters is to thwart out those nefarious types … who buy a new issue and dump it quickly" (p.43).

Flipping is also a problem in U.S. syndicates. Co-managers, who play an important role in the distribution of the offering, have a minor role in the aftermarket relative to lead underwriters.[2] This provides an incentive for co-managers to allocate shares, particularly in cold issues, to flippers, waiving the costly search of placing shares with long-term buy and hold investors (Hanley et al., 1996).

Positive aspects of flipping have also been identified in the literature. Flipping provides aftermarket liquidity, which may decrease the cost of trading and lower the issuing firm's cost of capital (Booth and Chua, 1986). Fishe (2002) models the impact of flipping for a profit maximising underwriter in the aftermarket. With a combination of a naked short position and allocating shares to investors identified as flippers in a weak offering, Fishe shows that underwriters can gain through covering their short position from a suppressed aftermarket price caused by flipping. Other economic benefits arising from flipping include aftermarket-trading profits (Ellis et al., 2000). For these reasons, U.S. underwriters seek to limit flipping, particularly in circumstances that would adversely affect stabilisation efforts, but not eliminate it.

The motivation for this paper stems from two sources. Firstly, Australian institutional arrangements are very different to those in the U.S. While U.S. underwriters frequently stabilise the aftermarket through the active trading and the exercise of over-allotment options, such activity is not legal for most of the IPOs in our sample, hence an Australian underwriter's role does not usually extend to the aftermarket.[3] However, despite price support being illegal, there is evidence that underwriters and other members of the IPO syndicate are active in the aftermarket, particularly for weak offerings (Wong, 2005). Another difference with the U.S. is that naked short positions (i.e.,

[1] See Hanley et al. (1993), Aggarwal (2000), Ellis et al. (2000), Aggarwal et al. (2002) and Fishe (2002).

[2] Ellis et al. (2000) find that co-managers only acquire 8.7% of the shares offered on the listing date, significantly less than that acquired by lead underwriters (58.8%). Importantly, the end of day 1 inventory position of the lead underwriter is on average 3.77% of the issue, while for co-managers it is only 0.07%.

[3] We investigated the use of over-allocation options by reading the prospectuses of our IPOs. We conclude that over-allotment options are very rare in Australian IPOs, particularly in the period of this study. In general, these options are restricted to more recent (i.e., after the end of our sample period) large and high profile IPOs. Before an over-allocation option can be used, the issuer must receive prior approval from the Australian regulatory authority, the Australian Securities and Investments Commission (ASIC). Only two of our IPOs, both of which were listed in July 2000, had over-allocation options, and in each case these were subsequently exercised in full. The two are Billabong International Limited which had an over-allocation option of 11 million shares on an issue of 109.4 million shares (approximately 10% of the issue size) and NRMA Insurance Group Limited which had an over-allocation option of 50.541 million shares on an issue of 336.950 million shares (approximately 15% of the issue). Billabong was underpriced by 38.2% and NRMA was underpriced by 10.8%. Accordingly, neither of these would be regarded as the exercise of an over-allocation option to cover aftermarket price support of a weak offering by the underwriter.

where the underwriter sells more than the allocation and then covers this short position with stabilising buying activity in the post-listing period) are not used in Australia. This provides us with a strong motivation for studying flipping in an Australian context. Further motivation to study Australian IPOs is that U.S. underwriters frequently discourage flipping through loss of priority in allocation and penalties (revocation of selling commissions) imposed on syndicate members if their shares are flipped. The observed levels of flipping in the U.S. are thus constrained by strong influences and incentives that cause investors to hold shares in the initial aftermarket. Investors in Australian IPOs have a free choice whether to sell their IPO allocations. Accordingly, our measure of flipping is not constrained as in the U.S., providing us with an opportunity to observe the flipping behaviour of IPO subscribers in the absence of such constraints.[4]

Our second source of motivation relates to the access of data on daily ownership records of investors in IPOs. These data come from Australian Stock Exchange Limited's (ASX) Clearing House Electronic Sub-register System (CHESS). CHESS records provide a unique data source allowing flipping behaviour to be studied across a broad cross-section of firms, industries and underwriters. CHESS records also allow us to investigate the daily ownership (i.e., the number of shares owned at the start of each day, the total number of shares bought each day, the total number of shares sold each day and the closing balance) records of all CHESS-registered holders in an IPO, not just the subscribers to an IPO.[5] In addition, we are also able to test several unique hypotheses used to explain flipping behaviour, which are adapted from the realms of behavioural finance and IPO research and are applied to the IPO aftermarket. We study a large sample of IPOs (419) for a five-year period (December 1995 [6] to December 2000) where inclusion is not dependent on having access to the records of a particular underwriter or set of underwriters.

2. Testable propositions related to flipping

This section reviews prior IPO research, and develops four testable propositions we use to explain flipping behaviour cross-sectionally.

2.1. IPO Underpricing

Numerous authors have examined flipping or aftermarket trading volume (a proxy for flipping) and its relationship with underpricing. Miller and Reilly (1987), Schultz and Zaman (1994) and Ellis et al. (2000) document a positive relationship between the initial return and initial aftermarket trading volume. Aggarwal (2003) obtains data from the Depositary Trust Company's (DTC) Initial Public Tracking System[7] and documents a positive relationship between flipping and the initial return.

Further research has investigated this relationship and premised their conclusions on features specific to the U.S. institutional framework. Boehmer and Fishe (2000), using data similar to Aggarwal (2003), achieve a comparable result. They argue that underpricing is the cost of providing liquidity in the initial aftermarket. Boehmer and Fishe propose a model focusing on

[4] We make these observations on institutional differences in Australia and the U.S. to motivate our study as taking place in a setting where flipping is believed to be less constrained. We also note below that the datasets and methods we use to determine levels of flipping differ from those used in prior U.S. studies. Accordingly, it is not possible in this paper to formally test whether flipping levels in Australia are significantly higher than those in the U.S.

[5] In other words we can distinguish between the IPO subscribers and investors who trade in the IPO after it has listed.

[6] December 1995 is the date on which CHESS records are first available.

[7] The DTC system provides reports on flipping to underwriters and syndicate members on a daily basis. See Aggarwal (2003, p. 116) for more details.

downward sloping demand curves, representing all investors who received an allocation. Deliberate underpricing by the underwriter ensures post-listing liquidity and market maker trading profits by inducing low valuation investors to flip to high valuation investors. They postulate that flipping and initial returns are endogenously determined.

In a different light, Krigman et al. (1999) use a trade of at least 10,000 shares as a proxy for institutional flipping. They document a negative relationship between underpricing and institutional flipping and explicate their results as an extension to Benveniste and Spindt's (1989) theoretical model. They argue that institutional investors become more aggressive in their flipping strategies when they are required to participate in less attractive offerings and conclude that flipping is a rational response to overpricing.[8]

These studies cannot explain the flipping behaviour in Australia. Australian issuance procedures occur under a fixed price offer system and underwriters are less able to interfere with the order flow in the aftermarket.[9] Hence, in the absence of an underwriter's need to develop post listing liquidity and its inability to develop a strong book building relationship, we expect underpricing to elicit certain behavioural tendencies affecting an investor's decision to sell in the aftermarket.

The disposition effect, described by Shefrin and Statman (1985, p. 778), refers to the tendency to "sell winners too early and ride winners too long". The behavioural model Shefrin and Statman employ to explain the disposition effect has four elements, with the most dominant being prospect theory.[10] Prospect theory is an implication of Kahneman and Tversky's (1979) psychological research, demonstrating behavioural biases in human judgement under uncertainty. In a series of laboratory experiments, Kahneman and Tversky showed that subjects, given a hypothetical lottery with similar expected values, were risk averse in the domain of gains and risk seeking when confronting losses. Kahneman and Tversky formalised their observations as an S-shaped value function. Expected utility, relative to a reference point in which gains and losses are measured, is concave over gains and convex over losses. Applying this behavioural heuristic to the IPO aftermarket provides a clear expectation that flipping will increase as a function of the initial return. The unique feature of our application of prospect theory to the IPO aftermarket[11] requires IPO investors to calculate gains and losses relative to the offer price, and measure their changes in wealth from the pre market to the aftermarket.

In light of the institutional characteristics facing investors in Australian IPOs and applying the psychological explanations driving the disposition effect to the IPO aftermarket, we expect:

A positive relationship between the proportion of shares flipped and the initial return.

2.2. Hot issue markets

IPO markets exhibit substantial time series variation in the level of underpricing and the volume of new issues. Periods of sustained high initial returns are referred to as hot issue markets.

[8] Hanley and Wilhelm (1995 p. 254) make similar suggestions in their analysis of Benveniste and Spindt's (1989) model.

[9] While underwriters in Australia have a limited role in the aftermarket, they have considerable discretion in the allocation of shares to IPO applicants. For a description of the issuance procedures used in Australia see Lee et al. (1996, pp. 1191–1194).

[10] The other elements in the model used by Shefrin and Statman are mental accounting, avoiding regret and self-control. See Shefrin and Statman (1985, p. 778–785) for more detail.

[11] Loughran and Ritter (2002) also use prospect theory to explain why issuers are willing to underprice IPOs. Prospect theory suggests that issuers will sum the wealth loss from "leaving money on the table" (i.e., underpricing) with the wealth gain on retained shares (i.e., the aftermarket listing price less the issue price).

This is first investigated by Ibbotson and Jaffe (1995) who confirm the existence of cycles in IPO underpricing. They report a statistically significant first order autocorrelation coefficient of 0.74 for the monthly average initial returns during the period 1960–1970.

A further peculiar feature of hot issue markets is the disproportionate concentration of firms in particular industries. For example, Ritter (1984) observes a distinct industry effect for natural resource IPOs in the hot issue market of 1980. Initial returns for this sector averaged 48.7%, while for other offerings underpricing was barely perceptible. In addition, Loughran and Ritter (1995) report numerous biotechnology and restaurant companies going public at high multiples in 1992, followed by golf club manufacturers and riverboat casinos in 1993.

We argue that the aforementioned statistical properties of IPO markets, in time series, are conducive to investors relying on the representativeness heuristic for judgements and prediction. The representativeness heuristic asserts that individuals assess the likelihood of an event's occurrence by observing the outcomes of similar prior events (Kahneman and Tversky, 1982).

Hot issue markets are a prime candidate for the dominance of this heuristic, because it has been demonstrated that these markets are, on average, sustainable (though transitory) and they can provide high returns for those receiving allocations. Further, the industry clustering provides ideal stereotypes for myopic investors to use in forming their judgements. Investment decisions based on this psychological tendency predict a time specific pattern where flipping is highly correlated with IPO market sentiment, particularly the magnitude of lagged and perhaps contemporaneous average initial returns. The representativeness heuristic applies to those investors who subscribe with the intent to flip (i.e., trend chasers) following lucrative patterns in the IPO market. However, flipping during times of high average initial returns may also be explained through the disposition effect described above.

In accordance with the representativeness heuristic we expect;

A positive relationship between the proportion of shares flipped and IPO market momentum.

2.3. Firm characteristics

Ex ante risk plays an important function in the prelisting stage of an IPO. Beatty and Ritter (1986) demonstrate a causal relationship between the ex ante risk characteristics of an IPO and underpricing. They contend that an investor, who decides to become informed, buys a call option in the IPO. A call option's value increases with the extent of uncertainty. This induces more investors to become informed, aggravating the winners' curse and increasing the required level of underpricing. In our focus on IPO investor activities in the aftermarket we argue that an IPO whose intrinsic value is more difficult to measure (greater ex ante risk characteristics) is more likely to attract investors with heterogenous beliefs concerning aftermarket values. Heterogenous beliefs are argued to create significant trading volume (Harris and Raviv, 1993), thus higher flipping is expected for those IPOs with greater ex ante risk as greater disagreement is expected concerning the true aftermarket price. This argument is supported by Miller and Reilly (1987) and Houge et al. (2001) who proxy aftermarket trading volume as the extent to which investors disagree about the value of an IPO. Therefore, we expect;

A positive relationship between ex ante risk and the proportion of shares that are flipped.

2.4. Underwriter reputation

Underwriters perform screening and signalling roles. Chemmanur and Fulghieri (1994) demonstrate that an investment bank's reputation is acquired from the capital market history of

the firms they underwrite. In a multiperiod setting they show that underwriting high quality firms enhances reputation while underwriting low quality firms tarnishes reputation. Hence, the ability to screen for firms providing strong, long-term aftermarket performance is pertinent to acquiring and maintaining reputation capital.

Michaely and Shaw (1994) and Carter et al. (1998) provide the empirical support for this model. They demonstrate significantly greater long-run returns to IPOs underwritten by more prestigious underwriters. This highlights their superior screening ability. Dunbar (2000) extends this notion and reinforces the strong motivation of highly reputable underwriters to devote costly resources to ensure accurate screening of issuing firms. In a study of investment banking market share changes, Dunbar finds that the one-year abnormal performance of issuing firms has a positive effect on the lead underwriter market share (and by implication, underwriter reputation).

Following this research we argue that the presence of a highly reputable underwriter will help investors form an expectation of favourable long-run prospects for the issuing firm. For this expectation to be formed pre listing, reputation must be observable in the pre market. The aforementioned research of Dunbar (2000), Carter et al. (1998) and Michaely and Shaw (1994) affirm the formation of this expectation through an underwriters' repeated presence and its continuous role of screening for quality IPOs. In addition to the capital market history of underwriters, reputation has also been shown to produce an observable effect during the issuing phase. For example, Carter and Manaster (1990) show reputation capital can mitigate adverse selection costs by reducing uncertainty and increasing investor confidence. Beatty and Ritter (1986), Nanda and Yun (1997) and Dunbar (2000) also provide similar results. Booth and Smith (1986) contend that reputation capital provides a bonding mechanism, observable to external investors, mitigating the asymmetrical information problem. In addition, the presence of a prestigious underwriter also provides a positive signal to the market, acknowledging issuer quality (Titman and Trueman, 1986; Allen and Faulhaber, 1989; Welch, 1989; Carter and Manaster, 1990).

Thus we argue that the presence of a reputable underwriter causes IPO investors, in the pre market, to form a positive expectation concerning the long-run prospects of the issuing firm. Accordingly, this should elicit greater shareholder loyalty, increasing investment horizons further than the initial aftermarket and reducing the incidence of flipping. We expect;

Highly reputable underwriters will be associated with lower flipping activity.

3. Data

3.1. Data sources

3.1.1. CHESS

CHESS data are used to analyse the daily ownership of IPO investors in the aftermarket. CHESS records provide a detailed electronic record of all daily purchases and sales by CHESS registered shareholders (identified by their HIN[12] number). CHESS records allow the researcher to identify whether the shareholder is local (the postcode is provided) or foreign, and the investor type. Nine types of investors are identified, namely banks, other deposit taking institutions, nominees, insurance companies, superannuation (pension) funds, trusts, governmental investments, incorporated companies and individuals. In subsequent analysis we separate the

[12] The HIN numbers used in the CHESS records supplied to researchers are disguised (though the same real HIN is consistently masked to an identical disguised HIN), and the records do not provide any detail of individuals. Accordingly, although we could calculate portfolio positions, the actual identities of individual holders were unknown.

institutional subscriptions in the first eight investor types (and related flipping) from individual subscriptions (and flipping).

Since the introduction of CHESS in 1995, the share registers of a listed company are segmented into three sub-registers; the Issuer Sponsored Sub-register, the Certificated Sub-register and the CHESS Sub-register. The listed company maintains the issuer sponsor sub-register. Investors in the certificated sub-register hold share certificates as physical documentation of share ownership. The CHESS sub-register is maintained by ASX and the vast majority of ASX listed companies are CHESS registered.[13] In most cases, IPO investors have the option to register their shares on CHESS, thus CHESS is only a partial data source (but the largest) for tracking changes in the trading activities of IPO investors. To elaborate, the mean (median) percentage of the issued shares of the IPO captured in the CHESS records is 59.0 (54.4).

CHESS is designed to automate the settlement process for ASX transactions taking place via the electronic trading system engine i.e., Stock Exchange Automated Trading System (SEATS). Settlement of trades in ASX listed securities is lagged after the actual transaction takes place. Prior to 1 February 1999, settlement was mandated within five days of the transaction. Post 1 February 1999, settlement occurred within three trading days. We assume that changes in the CHESS shareholding balances relate to trades that took place either five or three trading days previously.[14]

3.2. Share price data

The Volume Weighted Average Prices (VWAP) for each company in the sample are extracted from ASX's SEATS database and verified against the Core Research Data (CRD) database. Both databases are provided by the Securities Industry Research Centre of Asia-Pacific (SIRCA). Possible anomalies[15] in VWAP are verified against the share prices published in the Australian Financial Review.

3.3. Firm variable data

Firm variable data includes the issue price, the number of shares offered and outstanding at the completion of the issue, accounting information, the date of establishment and prospectus and listing dates. These are obtained from two data sources. The majority of the sample is hand collected from prospectuses, while the remainder is obtained from the SDC database.

3.4. Sample size

The SDC database was used to identify all IPOs listing between December 1995 and December 2000. The majority of companies in the sample were verified against their prospectus to ensure they were IPOs as opposed to other types of new listings. In total 457 IPOs were identified, 38 were omitted from our analysis (36 firms have insufficient CHESS information, one

[13] Approximately 97% of ASX listed stocks use CHESS as either a complete or partial ownership register. An individual security's level of coverage in CHESS can vary considerably, because some companies have the majority of their shares registered in the Issuer Sponsored or Certificated Sub-register. At December 1999 CHESS records included over one million holders or about five million security holdings representing about 60% of market capitalisation of ASX listed securities.

[14] ASX records indicate that more than 99% of trades settle on their expected settlement day.

[15] All price relatives greater than 1.5 or less than 0.5 were verified.

firm has its prospectus missing and one outlier is eliminated.[16]) Accordingly, our final sample of IPOs is 419.

4. Flipping: definition, methods of calculation and cross-sectional explanations

4.1. Definition of flipping

Flipping is defined as the liquidation of IPO allocations in the first three days of seasoning.[17]

The volume of shares flipped is recognised for each IPO investor as FLIP=Min [SOLD, INITIAL], where SOLD is the total number of shares sold by IPO investor *i* in the first three days and INITIAL is the number of shares invested in the IPO by IPO investor *i* before the issuing firm went public.

Hence, FLIP ignores aftermarket-buying activity and caps the volume of flipping by each IPO investor's original holdings. Any extra selling activity that occurs by IPO investors over and above their initial holdings is allocated to either a sale from a previous days purchase, a day trade or a short sale and is not subject to our flipping analysis.

In the empirical tests and results that follow we sum FLIP for each IPO subscriber, and then scale this sum by the total number of shares registered in CHESS for that IPO. Thus our flipping measures are scaled to be proportions of the total number of shares that could potentially be flipped.

Several previous studies have used aftermarket-trading volume divided by the number of shares offered as a proxy for the percentage of flipped shares (Miller and Reilly, 1987; Krigman et al., 1999[18]; Houge et al., 2001; Cheng et al., 2002). The above metric provides a significant contribution to this literature because we have an exact record of the trading by each CHESS-registered IPO subscriber.

4.2. Methodology for cross-sectional determinants

To cross-sectionally explain flipping behaviour the above metric is assumed to be a function of:

$$\text{FLIP} = f\ (\text{Underpricing},\ \text{Hot Issue Market},\ \ \text{Ex ante Risk and}\ \ \text{Underwriter Reputation})$$

4.3. Underpricing

Underpricing (UNDERP_{it}) is calculated as $(\text{VWAP}_{it} - \text{OFFER}_{it})/\text{OFFER}_{it}$ where OFFER_{it} is the offer price listed in the prospectus, and VWAP_{it} is the volume weighted average price for the first day of trading. Underpricing (UNDERP) is calculated on a 'headline' basis rather than on an adjusted

[16] Stadium Australia Limited, which listed on 11/04/1997, had an issue price of $10,000 and a closing price on the first day listing of $2,600. Not all of the entitlements in the Stadium Australia Limited IPO were transferable (for example subscribers received reserved tickets to the 2000 Sydney Olympic Games), and accordingly the first day listing price cannot be validly compared to the IPO issue price.

[17] We also investigated flipping defined over the first ten and first 35 days of trading. Similar results to those reported below were obtained. These are available on request to the corresponding author.

[18] Ellis (2006) demonstrates that the Krigman et al. (1999) proxy for flipping (i.e., trades of 10,000 shares or more) overestimates the level of flipping in cold IPOs, and underestimates flipping in hot IPOs.

basis.[19] This is because we are interested in modelling the gains to investors as opposed to the cost to the issuer.[20,21]

4.4. Hot issue market

Our second testable proposition seeks to capture those investors who subscribe with an intent to flip, motivated by recent trends in high average IPO underpricing (market momentum). This behaviour is likely to occur in a hot issue market. Hence we use the dummy variable HOT to measure the relationship between flipping and market momentum. HOT is equal to one if the IPOs listing month equally weighted average underpricing is above the median of all months equally weighted average underpricing or zero otherwise.

The first two testable propositions are closely interlinked. An application of the disposition effect to the IPO market (proposition 1) investigates the propensity of an investor to flip given their changes in wealth from the pre market to the aftermarket. While it predicts a positive relationship between flipping and the initial return, proposition 2, predicts a similar relationship, however for different reasons. This is principally due to trend chasing, stemming from cycles in average underpricing.

Although prior research has documented a significant positive serial correlation in monthly average initial returns, the previously observed price trends do not have any implications for the underpricing of any particular prospective issue. Thus, proposition 2 does not predict a positive relationship with underpricing per se, but the cycles in IPO underpricing produce a strong need to separate the flipping intentions outlined under proposition 1 when testing proposition 2.

This produces a need to develop a metric that (a) does not necessarily incorporate the IPOs' underpricing, and (b) places greater focus on market momentum, to more closely encapsulate the behavioural instinct of representativeness. In order to capture the essence of the representativeness heuristic, we propose the following two variables to be added in separate equations in our multivariate analysis; UNDER3P and UNDER3PIND. UNDER3P refers to the equally weighted underpricing for the three most recent IPOs prior to the issuing firm's prospectus date and UNDER3PIND is the equally weighted average underpricing for the three most recent IPOs within the issuing firm's industry prior to its prospectus date. The difference between these two variables examines whether investors look solely to past underpricing in the market or if IPO investors distinguish the recent underpricing of IPOs with similar characteristics in forming their predictions and judgements for flipping decisions.

4.5. Ex ante risk

Ex ante risk refers to the risk faced by an investor in determining the intrinsic value of an IPO. This risk is not directly observable and thus the IPO literature has used several proxies for ex ante

[19] Headline underpricing refers to the difference between the listing price and the offer price, expressed as a percentage of the offer price. Adjusted underpricing calculates the wealth loss for the entrepreneur, in the manner described in Habib and Ljungqvist (2001).

[20] See Barry (1989) for related work.

[21] We use a raw return to conform to our psychological explanation of flipping and underpricing. Prospect theory argues that gains and losses are calculated relative to a reference point, and is silent on whether the reference point is updated relative to the returns which could have of been earned on similar assets. The remaining three explanations for the disposition effect, namely mental accounting, regret theory and self-control, are also silent on whether selling decisions are affected by the returns on similar financial assets.

risk. Three proxies are used in this paper; firm age, the standard deviation of aftermarket returns and issue size. AGE measures the operating history of the issuing firm, denoted in the number of years since incorporation. STDRET is the standard deviation of returns for each firm, estimated from a time series of daily raw returns from the second day of listing through to day 25 and SIZE is the nominal gross proceeds of the issue.

4.6. Underwriter quality

Underwriter quality (UWQ) measures the presence of a highly reputable underwriter with a dummy variable equal to one if the underwriter is (or is backed by) a major financial institution or bank or zero otherwise.[22] If a syndicate of underwriters markets an IPO, only one underwriter needs to be high quality for the issuing firm to obtain a value of one.

5. Results

5.1. Descriptive statistics

5.1.1. Sample characteristics

Table 1 contains descriptive statistics for the IPOs included in this study. There are several statistics worthy of note. The average size of the issued capital is $A84.9 million, but the distribution is skewed by some very large IPOs. Total funds raised by these 419 IPOs is $A35.573 billion. The average age of the issuing firm is 5.89 years, though 25% of firms have an operating history of less than one year. The IPOs we study are typically underpriced (on average by 26.72%), but more than a quarter of them are overpriced.[23] It is also clear that there is evidence of cycles in IPO underpricing, because the three previous IPOs prior to the issuing firm are also underpriced (on average by 26.82%) as are the three previous IPOs in the same industry as the issuing firm (on average by 27.62%). Individuals on average acquire 24.2% of the CHESS registered issued shares, while institutions have a stake that is three times larger at 75.8%, this being very similar to the institutional allocation in the U.S. of 73.3% recorded by Aggarwal (2003). We also calculated the correlation between the short run (underpricing) and long-run performance of our IPOs and the proportion of the issue allocated to institutional investors. The correlation of 0.152 with underpricing is significant at the 1% level, and indicates that institutional investors subscribe for, and are allocated, a larger proportion of the IPOs that have better immediate market reaction. This result is consistent with the evidence provided by Lee et al. (1999) for Singapore IPOs, and Aggarwal et al. (2002) and Boehmer et al. (in press) for the U.S. However, in contrast to Boehmer et al. (in press) the correlation between institutional allocations and both our long-run return measures (0.067 for ABN250 and 0.035 for ABN500) are insignificant.

Total shares flipped in the first three days of trading are 22.07%. We calculated the proportion of total trading activity in the first three days of listing that is due to flipping. We find that flipping in these three days accounts for 34.54% of total trading, that day traders account for 51.90% and that selling by investors who bought shares subsequent to the IPO comprise the other 13.56%.

[22] This measure is based on Taylor (1991) where a high quality underwriter has ‘deep pockets’ or a significant national presence.

[23] Specifically there are 133 of the 419 IPOs that were overpriced. In subsequent results we analysis the flipping behaviour of these two groups separately.

Table 1
Descriptive Statistics for 419 Australian IPOs made between December 1995 and December 2000

Variable	Mean	S.D.	Max.	75th %	Median	25th %	Min.
SIZE	84.9	839.9	16,673.1	25.5	8.5	5.0	0.1
STDRET	0.05	0.03	0.19	0.06	0.04	0.02	0.01
AGE	5.89	4.91	37.00	10.00	5.00	1.00	0.00
UNDER	26.72	74.18	733.50	30.49	8.24	−2.88	−65.97
UNDER3P	26.82	49.14	445.80	38.40	11.14	0.80	−35.19
UNDER3PIND	27.62	48.44	322.29	36.77	11.04	1.09	−28.30
ABN250	−14.11	74.94	687.15	4.16	−26.71	−59.50	−96.34
ABN500	−25.27	74.40	501.32	−0.15	−40.84	−75.03	−98.80
FLIP	22.07	17.84	82.56	32.74	16.60	8.54	0.00
INDIV	24.20	16.27	81.34	33.91	21.73	11.98	0.27
INSTIT	75.80	16.27	99.73	88.02	78.27	66.09	18.66
IFLIP_C	1.64	2.21	20.42	2.23	0.94	0.33	0.00
IFLIP_O	7.84	8.46	56.46	11.29	5.11	1.90	0.00
NFLIP_C	20.43	16.88	82.56	30.11	15.39	7.80	0.00
NFLIP_O	27.22	21.68	97.80	40.62	20.67	10.52	0.00

SIZE is the nominal gross proceeds of the issue measured in millions. STDRET is the standard deviation of returns for each firm estimated from a time series of daily raw returns from the second date of listing through to day 25. AGE is the operating history of the issuing firm, measured in the number of years since incorporation. UNDERP is the underpricing for IPO. UNDER3P is the underpricing for the three previous IPOs (irrespective of industry) before the IPOs prospectus date. UNDER3PIND is the underpricing for the three previous IPOs within the IPOs industry before its prospectus date. ABN250 is the 250 day post-listing market adjusted buy and hold return for the issuing firm, while ABN500 is for the 500 day post-listing period. FLIP is defined in Section 4. INDIV is the proportion of the CHESS registered shares subscribed by individuals, while INSTIT is the proportion subscribed by institutional investors. IFLIP_C is FLIP for individual subscribers, scaled by total CHESS registered shares, while IFLIP_O is FLIP for individuals scaled by the individual only CHESS registered shares. NFLIP_C and NFLIP_O are analogous except that they measure institutional subscriptions and flipping activity.

These calculations demonstrate that Aggarwal's (2003) results concerning the substantial difference between the volume of shares flipped (an average of 15.00% of the shares offered are flipped on the first day of listing) and aggregate trading volume (an average of 81.97% of the shares offered are traded on the first day) are not specific to the Nasdaq market.

In closely-related work, Ellis (2006) investigates, among other things, the apparent disconnect between high initial trading volumes and relatively low flipping for a set of 311 Nasdaq U.S. IPOs that went public between September 1966 and July 1997. She asks what causes high initial trading, given it is not primarily flippers. Ellis demonstrates that interdealer trading in the first two days is quite high (23% of trading in all IPOs) and that there are differences in interdealer trading in cold IPOs (30%) and hot IPOs (18%).

In subsequent tests we seek cross-sectional explanations for cross-sectional differences in the average flipping of 22.07% detailed in Table 1. We also separate flipping activity into individual versus institutional categories, and we then scale this flipping in two ways. First we scale by total CHESS registered shareholdings, and second we scale by the sum of the individual subscribers and the sum of the institutional subscribers. Institutions are more aggressive in their flipping activity. They account for 20.43% of the total of 22.07%. They flip 27.22% of their allocations, while individuals only flip 7.84% of their allocations. Similar results are encountered in the U.S. where Aggarwal (2003) shows that institutions flip 46.74% of their allocations of "hot" IPOs and 19.90% of their allocations in "cold" IPOs. Comparative numbers for retail investors are 27.86% for "hot" IPOs and 11.53% for "cold" IPOs.

Table 2
Realised and unrealised profits for the first three days of trading for all CHESS registered subscribers, individual CHESS registered subscribers and institutional CHESS registered subscribers in 419 Australian IPOs (Panel A), the 212 small IPOs with an issue size of less than or equal to $A8.5 (Panel B) and the 207 large IPOs with an issue size of greater than $A8.5 million (Panel C) made between December 1995 and December 2000

	Day 1			Day 2			Day 3		
	REAL1	CUM REAL1	UN-REAL1	REAL2	CUM REAL2	UN-REAL2	REAL3	CUM REAL3	UN-REAL3
Panel A — All 419 IPOs All Subscribers	288.3	288.3	1946.3	78.5	366.9	1583.5	52.9	419.8	1417.0
Individuals	13.6	13.6	174.6	9.0	22.6	157.5	5.4	28.0	149.1
Institutions	274.7	274.7	1771.6	69.5	344.3	1426.0	47.5	391.8	1267.8
Panel B — 212 Small IPOs All Subscribers	50.1	50.1	105.7	10.1	60.2	94.0	4.1	64.3	93.3
Individuals	2.6	2.6	33.0	2.0	4.7	30.7	1.3	6.0	31.6
Institutions	47.5	47.5	72.7	8.0	55.5	63.3	2.8	58.3	61.7
Panel C — 209 Large IPOs All Subscribers	238.2	238.2	1840.7	68.5	306.7	1489.4	48.8	355.5	1323.7
Individuals	11.0	11.0	141.7	7.0	17.9	126.8	4.1	22.0	117.6
Institutions	227.3	227.3	1699.0	61.5	288.8	1362.7	44.7	333.5	1206.1

REAL refers to realised gains. CUMREAL is the sum of the realised gains for day 1 to day n, $n=1, 3$. UNREAL is gains that have not been realised. All amounts are in $A millions and define flipping as the proportion of the shares allocated to IPO investors that are sold in the first three days of aftermarket trading.

5.1.2. Realised and unrealised profits in IPO subscriptions

We also calculated the dollar values of the realised and unrealised gains for individual, institutional and all subscribers to the 419 IPOs for the first three days of trading. These results are in Table 2. It is clear that institutions dominate both the subscriptions and realisation of gains through flipping. On the first day of trading institutions realise $A274.7 million (or 95.3%) of the total realised gains for all subscribers of $A288.3 million. On day 1 their unrealised gains of $A1,771.6 million dominate the unrealised gains for individuals of $A174.6 million. In total "money left on the table" in these 419 IPOs on day 1 is $A2.2346 billion.[24] By day 2 this falls to $A1.9504 billion and $A1.8368 billion by day 3.[25] By day 3 cumulative realised gains (which are of course due to investor's flipping their shares during these three days) are $A419.8 million for all subscribers, only $A28 million for individual subscribers and $A391.8 million for institutions. Thus, institutional investors account for 93.3% of the three-day realisations. Recall from Table 1 that institutions are allocated an average of 75.8% of the IPOs we study, and hence they are more aggressive in realising their gains than individuals.

Panels B and C contain the analogous results for the 212 small IPOs with an issue size of less than or equal to $A8.5 million (Panel B) and the 207 large IPOs with an issue size greater than $A8.5 million. As expected individuals subscribe for a much larger proportion of the small IPOs than the large IPOs. Using day 1 realised and unrealised gains for individuals as a proportion to total realised and unrealised day 1 gains shows that individuals subscribe for 22.8% of the small

[24] The average "money left on the table" is $A5.33 million, which is approximately half that in Loughran and Ritter (2002). Loughran and Ritter find an average of $U.S.9.1 million for 3025 U.S. IPOs made between 1990 and 1998.

[25] The largest IPO in our sample is AMP Limited, which has 64,561,789 CHESS registered shares. AMP shares had an issue price of $A16 per share and a volume-weighted-average-price of $A24.68 on day 1, $A20.64 on day 2 and ($A19.80 on day 3. Thus the price decline in AMP of $A4.04 between day 1 and 2 would cause aggregate gains to drop by $A261 million, and the drop in price between day 2 and 3 explains a further $A54 million. Thus this one IPO explains 80% of the total fall in post-listing gains (i.e., the sum of realised and unrealised gains).

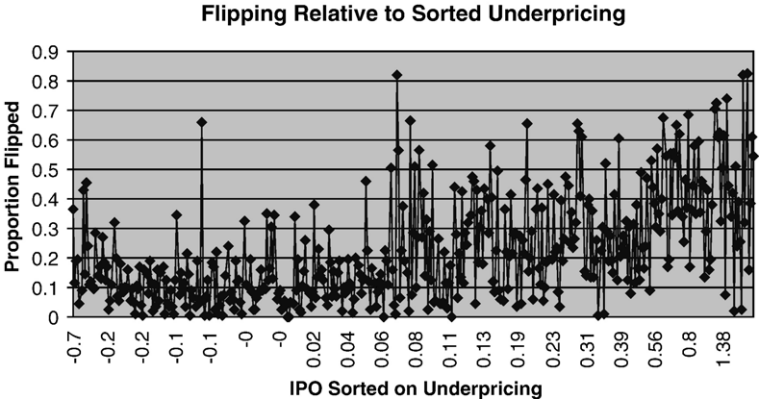

Fig. 1. Proportion of the CHESS-registered shares in 419 Australian IPOs made between December 1995 and December 2000 that are flipped during the first three days of seasoning as the definition of flipping relative to each firm's initial underpricing sorted from the most overpriced to the most underpriced.

IPOs, but only 7.3% of the large IPOs. Institutions flip the small IPOs much more aggressively than individuals. By day 3 the proportion of realised to unrealised gains for institutions in small IPOs is 94.5% (this calculation for individuals in small IPOs is 19.0%), while it is only 27.6% for the large IPOs (and individuals are 18.7%). Individuals seem to flip about the same proportion of small and large IPOs, but institutions quit the smaller IPOs much more quickly. Money left on the table (using day 1 realised and unrealised gains) in small IPOs is on average $A0.73 million (or 15.0% of the average issue size of $A4.90 million), while the corresponding amount for the large IPOs is $A10.04 million (or 6.02% of the average issue size of $A166.86 million).

5.1.3. Flipping and underpricing

Fig. 1 provides a plot of flipping activity (FLIP) for each of our 419 IPOs, after sorting these from the most overpriced to the most underpriced. An inspection of Fig. 1 reveals that the sign of the relationship between underpricing and flipping changes conditional on whether the issue is underpriced or overpriced. For underpriced IPOs there is a positive association between IPO flipping and underpricing. However for overpriced issues, this relationship is negative, with a higher proportion of the most overpriced IPOs being flipped than for the less overpriced.

While Aggarwal (2003, p.125) does not specifically comment on this in her paper, an inspection of the median level of flipping in her Table 4 also suggests this pattern. Specifically the median levels of flipping for her four categories of IPOs, namely very cold, cold, warm and very hot are 7.22%, 5.35%, 11.17% and 25.11%, respectively. In our subsequent cross-sectional tests of flipping we allow for this pattern by introducing the square of underpricing as an independent variable.

5.2. Cross-sectional results

We model flipping activity as a function of underpricing, all three proxies for the representative heuristic (hot issue markets), underwriter quality and the log of the nominal proceeds of the issue. In our analysis firm size is chosen over the standard deviation of aftermarket returns[26] as a better

[26] In unreported results, the model was re-estimated with the standard deviation of aftermarket returns replacing firm size as a proxy for ex ante risk and qualitatively similar results are achieved.

Table 3
Multivariate regression results for 419 Australian IPOs made between December 1995 and December 2000 where the dependent variable is the proportion of the CHESS-register shares that are flipped during the first three days of trading, and the independent variables are various firm, underwriter and market characteristics

Intercept	UNDERP	UPSQR	HOT	UNDER3P	UNDER 3PIND	SIZE	UWQ	Adj R^2
Panel A — FLIP for All Subscribers								
0.1603	0.1849	−0.023	0.046					0.2455
(17.23)***	(6.18)***	(−3.97)***	(2.88)***					
0.1736	0.1973	−0.0257		0.0383				0.2415
(21.15)***	(6.75)***	(−4.36)***		(1.71)**				
0.1724	0.1989	−0.0252			0.0376			0.2356
(21.09)***	(6.87)***	(−4.34)***			(2.62)***			
0.5714	0.182	−0.0228	0.0452			−0.0251	−0.0076	0.2835
(6.15)***	(6.17)***	(−3.85)***	(2.88)***			(−4.42)***	(−0.25)	
0.5781	0.1954	−0.0255		0.0335		−0.0246	−0.0063	0.2776
(6.21)***	(6.77)***	(−4.25)***		(1.45)*		(−4.38)***	(−0.21)	
0.5664	0.1974	−0.0252			0.0345	−0.024	−0.0068	0.2690
(5.88)***	(6.90)***	(−4.23)***			(2.29)**	(−4.14)***	(−0.23)	
Panel B — FLIP for Institutional Subscribers								
0.2027	0.1963	−0.0244	0.0585					0.1982
(17.57)***	(5.57)***	(−3.53)***	(2.90)***					
0.2189	0.2114	−0.0277		0.0520				0.1954
(21.06)***	(6.12)***	(−3.96)***		(1.75)**				
0.2174	0.2143	−0.0271			0.0496			0.1897
(21.39)***	(6.31)***	(−3.94)***			(2.86)***			
0.899	0.1916	−0.0240	0.0571			−0.0426	0.0058	0.2694
(7.45)***	(5.58)***	(−3.40)***	(2.95)***			(−5.80)***	(0.16)	
0.9064	0.2081	−0.0273		0.0443		−0.0420	0.0075	0.2638
(7.53)***	(6.17)***	(−3.82)***		(1.44)*		(−5.79)***	(0.22)	
0.8859	0.2117	−0.0271			0.0449	−0.0408	0.0058	0.2532
(7.17)***	(6.37)***	(−3.80)***			(2.50)***	(−5.50)***	(0.16)	
Panel C — FLIP for Individual Subscribers								
0.0528	0.0856	−0.0138	0.0206					0.1906
(14.46)***	(5.67)***	(−4.05)***	(2.60)***					
0.0591	0.0917	−0.0150		0.0152				0.1851
(16.36)***	(6.40)***	(−4.35)***		(1.85)**				
0.0609	0.0948	−0.0151			0.0053			0.1783
(15.34)***	(6.47)***	(−4.33)***			(0.70)			
0.0013	0.0858	−0.0138	0.0206			0.0033	−0.0247	0.1915
(0.03)	(5.74)***	(−4.09)***	(2.61)***			(1.10)	(−1.57)*	
0.0044	0.0919	−0.0150		0.0152		0.0035	−0.0241	0.1860
(0.09)	(6.48)***	(−4.39)***		(1.87)**		(1.18)	(−1.55)*	
0.0107	0.0949	−0.0151			0.0048	0.0032	−0.0237	0.1787
(0.22)	(6.54)***	(−4.35)***			(0.64)	(1.05)	(−1.50)*	

UNDERP is the underpricing for IPO i, $SIZE_{it}$ is the nominal gross proceeds of the issue measured in millions, AGE is the operating history of the issuing firm, measured in the number of years since incorporation and STDRET is the standard deviation of returns for each firm estimated from a time series of daily raw returns from the second date of listing through to day 25, UWQ is a dummy variable equal to one if the IPO is (or is backed by) a major financial institution or bank and HOT is a dummy variable equal to one if the equally weighted underpricing for the listing month is above the median. UNDER3PIND is the underpricing for the three previous IPOs within the IPOs industry before its prospectus date, while UNDER3P is the underpricing for the three previous IPOs (irrespective of industry) before the IPOs prospectus date.
All t-statistics are White's (1980) heteroskedasticity adjusted.
* Significant at 10% (one-tailed test). ** Significant at 5% (one-tailed test). *** Significant at 1% (one-tailed test).

proxy for ex ante risk because it exhibits less heteroskedasticity in the univariate analysis and less kurtosis.

Table 3 has three panels, all of which use the proportion of the shares allocated to IPO investors that are sold in the first three days of aftermarket trading as the measure of flipping. In panel A we show the regression results when all subscribers' flipping activity is modelled. In panel B we confine the flipping to institutional investors, while in panel C the flipping is for individuals. The results from Table 3 show strong support for underpricing as a significant determinant of flipping in each of the three panels. We also include the square of underpricing to capture the non-linear relationship between flipping and underpricing evident in Fig. 1. The results in Table 3 indicate clear statistical evidence of this non-linear relationship with highly significant negative coefficients for each panel for the underpricing squared variable. Strong results are also found for the representative heuristic, *HOT* is significant in all multivariate regressions. Weaker support is found for the average underpricing of the three previous IPOs before each IPOs prospectus date, however relatively strong support is documented for the average underpricing for the three previous IPOs within the issuing firms industry before its prospectus date in panel A and B. However individual flipping in panel C is unrelated to the underpricing of the three previous IPOs in the same industry.

A negative relationship between firm size and flipping is documented for all subscribers (panel A) and institutional subscribers (panel B), as predicted, however individual investor flipping is unrelated to firm size. Underwriter quality (*UWQ*) is insignificant in panel A and B, however individuals flip less of the issues underwritten by higher quality underwriters (panel C). It seems that individuals are less aware of industry trends than institutions, and that they rely more on signals such as underwriter prestige.

From these results we infer that flipping behaviour is mainly concentrated in small, speculative underpriced IPOs that list when the market is highly receptive to their pricing, i.e., where previous IPOs with similar characteristics were highly underpriced. We also show strong evidence of a non-linear relationship between flipping and underpricing. Institutional subscribers flip significantly less

Table 4
Multivariate regression results for 419 Australian IPOs made between December 1995 and December 2000 where the dependent variable is the proportion of the CHESS-register shares that are flipped by informed investors (panel A) and uninformed investors (panel B) during the first three days of trading, and the independent variables are the long-run return performance for the firm and various firm, underwriter and market characteristics

Intercept	ABN250	UNDERP	HOT	SIZE	UWQ	Adj R^2
Panel A — Informed Investors						
0.8440	−0.0104	0.0897	0.0811	−0.0402	0.0175	
(6.83***)	(−0.98)	(4.61***)	(4.32***)	(−5.35***)	(0.47)	0.2303
Panel B — Uninformed Investors						
0.2780	0.0124	0.0783	0.0084	−0.0117	−0.0370	
(3.73***)	(2.23**)	(3.76***)	(0.74)	(−2.63***)	(−2.44***)	0.2389

This table analyses the flipping activity of decile 9 and 10, our proxy for the most informed IPO investors and decile 1 and 2, our proxy for the least informed IPO investors. Deciles are formed by ranking investors by the size of their initial allocation in the IPO, from smallest to largest. ABN250 is the 250 day market adjusted buy and hold return for issuing firm. UNDERP is the underpricing for the IPO, SIZE is the nominal gross proceeds of the issue measured in millions, and HOT is a dummy variable equal to one if the equally weighted underpricing for the listing month is above the median. UWQ is a dummy variable equal to one if the IPO is (or is backed by) a major financial institution or bank.
All *t*-statistics are White's (1980) heteroskedasticity adjusted.
* Significant at 10% (one-tailed test). ** Significant at 5% (one-tailed test). *** Significant at 1% (one-tailed test).

Table 5
Multivariate regression results for 419 Australian IPOs made between December 1995 and December 2000 where the dependent variable is the proportion of the CHESS-register shares that are flipped during the first three days of trading, and the independent variables are various firm, underwriter and market characteristics

Intercept	UNDERP	HOT	UNDER3P	UNDER 3PIND	SIZE	UWQ	Adj R^2
Panel A — 286 Underpriced IPOs, All Subscribers							
0.1873	0.0669	0.0759					0.1490
(13.45)***	(3.96)***	(3.77)***					
0.2191	0.0690		0.0503				0.1322
(17.86)***	(3.73)***		(1.70)**				
0.2153	0.0734			0.0549			0.1343
(17.79)***	(4.18)***			(3.13)***			
0.7364	0.0632	0.0708			−0.0333	−0.0044	0.2135
(5.69)***	(3.96)***	(3.67)***			(−4.22)***	(−0.12)	
0.7627	0.0659		0.0427		−0.0330	−0.0064	0.1961
(5.84)***	(3.75)***		(1.40)*		(−4.20)***	(−0.18)	
0.7537	0.0695			0.0503	−0.0327	−0.0051	0.1959
(5.58)***	(4.24)***			(2.67)***	(−4.04)***	(−0.15)	
Panel B — 286 Underpriced IPOs, Institutional Flipping							
0.2345	0.0716	0.0863					0.1180
(13.33)***	(3.76)***	(3.41)***					
0.2684	0.0723		0.0659				0.1089
(17.60)***	(3.45)***		(1.70)**				
0.2632	0.0785			0.0720			0.1121
(17.98)***	(4.01)***			(3.57)***			
1.1253	0.0662	0.0786			−0.0541	0.0185	0.2266
(6.67)***	(3.73)***	(3.35)***			(−5.29)***	(0.42)	
1.1501	0.0679		0.0543		−0.0537	0.0164	0.2158
(6.79)***	(3.46)***		(1.36)*		(−5.28)***	(0.39)	
1.1288	0.0728			0.0655	−0.0527	0.0168	0.2140
(6.50)***	(4.09)***			(3.07)***	(−5.06)***	(0.41)	
Panel C — 286 Underpriced IPOs, Individual Flipping							
0.0716	0.0157	0.0324					0.0565
(11.64)***	(2.08)**	(3.27)***					
0.0859	0.0171		0.0184				0.0395
(14.73)***	(2.09)**		(1.80)**				
0.0879	0.0199			0.0076			0.0307
(14.31)***	(2.50)***			(0.80)			
−0.0030	0.0153	0.0321			0.0048	−0.0380	0.0605
(−0.05)	(2.06)**	(3.24)***			(1.24)	(−1.95)**	
0.0096	0.0167		0.0184		0.0049	−0.0389	0.0439
(0.15)	(2.07)**		(1.83)**		(1.28)	(−1.99)**	
0.0240	0.0194			0.0069	0.0041	−0.0375	0.0338
(0.37)	(2.48)***			(0.73)	(1.04)	(−1.91)**	
Panel D — 133 Overpriced IPOs, All Subscribers							
0.0952	−0.1762	0.0046					0.0389
(5.97)***	(−2.43)***	(0.26)					
0.1002	−0.1709		−0.0189				0.0431
(7.21)***	(−2.37)***		(−1.13)				
0.1013	−0.1684			−0.0142			0.0397
(6.68)***	(−2.30)**			(−0.88)			
0.1025	−0.1725	0.0051			−0.0003	−0.0242	0.0269

Table 5 (*continued*)

Intercept	UNDERP	HOT	UNDER3P	UNDER 3PIND	SIZE	UWQ	Adj R^2
(1.18)	(−2.37)***	(0.29)			(−0.07)	(−1.35)*	
0.1078	−0.1667		−0.0199		−0.0003	−0.0258	0.0316
(1.26)	(−2.30)**		(−1.18)		(−0.07)	(−1.41)*	
0.0856	−0.1662			−0.0157	0.0011	−0.0338	0.0288
(0.94)	(−2.27)**			(−0.96)	(0.20)	(−1.79)**	
Panel E — 133 Overpriced IPOs, Institutional Flipping							
0.1275	−0.2033	0.0212					0.0287
(6.63)***	(−2.34)***	(0.84)					
0.1381	−0.1937		−0.0147				0.0247
(7.73)***	(−2.22)**		(−0.54)				
0.1418	−0.1868			−0.0186			0.0242
(7.07)***	(−2.10)**			(−0.77)			
0.2819	−0.1858	0.0228			−0.0092	−0.0367	0.0286
(2.36)***	(−2.13)**	(0.91)			(−1.30)*	(−1.44)*	
0.2903	−0.1754		−0.0169		−0.0090	−0.0369	0.0242
(2.49)***	(−1.99)**		(−0.62)		(−1.30)*	(−1.57)*	
0.2672	−0.1727			−0.0220	−0.0074	−0.0494	0.0221
(2.15)**	(−1.93)**			(−0.91)	(−1.01)	(−2.04)**	
Panel F — 133 Overpriced IPOs, Individual Flipping							
0.0238	−0.0410	0.0090					0.0070
(3.97)***	(−1.21)	(0.87)					
0.0276	−0.0378		−0.0020				−0.0019
(6.73)***	(−1.18)		(−0.26)				
0.0275	−0.0380			−0.0018			−0.0020
(6.21)***	(−1.22)			(−0.24)			
0.0291	−0.0398	0.0092			−0.0003	−0.0057	−0.0074
(0.64)	(−1.25)	(0.87)			(−0.10)	(−0.45)	
0.0315	−0.0367		−0.0022		−0.0002	−0.0054	−0.0166
(0.67)	(−1.21)		(−0.29)		(−0.08)	(−0.46)	
0.0218	−0.0375			−0.0022	0.0004	−0.0096	−0.0163
(0.43)	(−1.26)			(−0.29)	(0.13)	(−0.76)	

Panel A relates to the 286 underpriced IPOs (and Panel B and C to institutional and individual partitions of these) while Panel D is for the 133 overpriced IPOs (with Panels E and F being institutional and individual partitions of these). UNDERP is the underpricing for IPO, SIZE is the nominal gross proceeds of the issue measured in millions, AGE is the operating history of the issuing firm, measured in the number of years since incorporation and STDRET is the standard deviation of returns for each firm estimated from a time series of daily raw returns from the second date of listing through to day 25, UWQ is a dummy variable equal to one if the IPO is (or is backed by) a major financial institution or bank. HOT is a dummy variable equal to one if the equally weighted underpricing for the listing month is above the median. UNDER3PIND is the underpricing for the three previous IPOs within the IPOs industry before its prospectus date, while UNDER3P is the underpricing for the three previous IPOs (irrespective of industry) before the IPOs prospectus date. All *t*-statistics are White's (1980) heteroskedasticity adjusted.
* Significant at 10% (one-tailed test). ** Significant at 5% (one-tailed test). *** Significant at 1% (one-tailed test).

of the larger firms, while individual investors rely more on underwriter reputation, and are more loyal to the more prestigious underwriters.

5.2.1. Informed and uninformed shareholder analysis

In addition to our cross-sectional analysis we study the aftermarket activities of informed investors relative to their uninformed counterparts. We expect that informed investors will

subscribe to IPOs that are underpriced, in a manner consistent with Rock (1986). While Rock (1986) does not provide a prediction of informed investor activities in the aftermarket, we conjecture that informed investors in Australia are able to abstain from participating in unattractive offers without the penalty of future exclusions imposed by underwriters, which may invoke aggressive flipping activity. Hence, we expect informed investors to discern IPO quality and flip a lower portion of their holdings for IPOs providing greater long-run returns relative to uninformed investors.

We proxy the informational advantage of certain shareholders by the size of their investment in each IPO. We create deciles of investors based on the size of their initial holding (allocation) in the particular IPO. Decile 1 and 2 represent the least informed investors (i.e., the smallest subscribers) and decile 9 and 10 represent the most informed (or largest) investors.

Table 4 presents the results for informed and uninformed investor flipping while controlling for the other hypothesised motives. Panel A reveals long-run return to be an insignificant explanatory variable for informed investors, consistent with the proposition that informed investors do not flip a smaller proportion of the issue that subsequently perform better. Krigman et al. (1999) have contrary results, showing that the higher the flipping by block traders (their proxy for flipping), the smaller is the subsequent long-run (six and 12 months) performance of the IPO. However, the more recent study by Boehmer et al. (in press) shows that actual flipping by institutional and retail investors is unrelated to long-run IPO performance. The other control variables display similar results to Table 3.

Uninformed investor flipping behaviour has a significant positive relationship with long-run returns, meaning that uninformed investors flip more of the IPOs with superior long-run returns. We interpret this to be uninformed investors erroneously flipping the more successful IPOs and holding their poor investments. This contrasts the Boehmer et al. (in press) result of no association between retail flipping and long-run performance. The significance and direction of the coefficients on the control variables in Table 4 Panel B are similar to the results presented in Table 3, with the exception of underwriter quality, which is significantly negative.

5.3. Additional analysis

The disposition effect suggests that investors will realise their gains more often than they will come to grips with their losses via a realisation. Our sample of 419 IPOs has 286 underpriced IPOs and 133 overpriced issue. We calculated the average flipping for these two groups for our three flipping metrics. The average flipping for the underpriced IPOs is 26.79%. The corresponding average for the overpriced IPOs is 12.12%. The flipping of overpriced IPOs is significantly lower than for the underpriced issues at better than a 1% level of confidence (the t-stat is −10.34). These results are consistent with investors in Australian IPOs showing a strong preference to realise their winning investments rather than their losing investments. Aggarwal (2003) with average flipped shares in the very cold, cold, warm and very hot IPOs being 9.80%, 11.10%, 16.09% and 30.21%, respectively.

We also conducted the multivariate regression analysis contained in Table 3 separately for the underpriced and overpriced IPOs. The results using our FLIP metric are contained in Table 5. An interesting result emerges. For the underpriced IPOs the estimated coefficient on UNDERP is always significantly positive, meaning that investors flip a significantly larger portion of the IPOs with the largest underpricing. This is consistent with our prediction. However, for the overpriced IPOs the coefficient on UNDERP is consistently significantly negative. Hence flipping is higher for the IPOs that are the most overpriced. While the result for the underpriced IPOs is consistent with investors being subject to a disposition effect, the overpriced IPO results are opposite to what

would be expected if investors have difficulty in coming to grips with their poor investment decisions. Indeed the results are consistent with them selling off larger proportions of their very worst IPO investments. The disposition effect has been shown to be remarkably robust, and our evidence of IPO investors being able to come to grips with their losses, is somewhat unique.

In panel B and C of Table 5 we split our analysis of the underpriced issues into institutional investors (panel B) and individual investors (panel C). The underpricing coefficient is significantly positive in both sets of results, though it is somewhat stronger for the institutional investors. Other differences in these results are (a) institutional investors have significant positive coefficients on UNDER3IND (and individuals do not), (b) institutional investors flip fewer shares in the larger issues (and individuals do not) and (c) individuals have a significant negative coefficient on UWQ, meaning they stay more loyal to the more prestigious underwriters (and institutions do not).

Turning now to panels E and F of Table 5, which relates to institutional flipping and individual flipping of the overpriced issues. From panel F for individuals our results show that none of the independent variables are significant, and indeed the models have essentially zero explanatory power. In contrast, in panel E for institutions, the estimated coefficient on underpricing is significantly negative. In short it is the institutions that are able to come to grips with their losses and sell a higher proportion of the most overpriced issues[27]. Evidence contrary to the disposition effect is quite rare, but it seems that institutional investors in overpriced Australian IPOs are prepared to quit the IPOs that are least favourably received by the market when they list.

6. Conclusion

This paper is motivated by two main issues. Firstly, Australian institutional arrangements are very different to those in the U.S. where the main flipping experiments have been conducted. While U.S. underwriters frequently stabilise the aftermarket, such activity is not legal for most of the IPOs in our sample, hence an Australian underwriter's role does not usually extend to the aftermarket. This provides us with a motivation to study flipping in Australia. U.S. underwriters frequently discourage flipping through loss of priority in allocation and penalties (revocation of selling commissions) imposed on co-managers if their shares are flipped. Thus the observed levels of flipping in the U.S. are constrained by strong influences and incentives that cause investors to hold shares in the initial aftermarket. Investors in Australian IPOs have a free choice whether to sell their IPO allocations. Accordingly, our observed measures of flipping are not constrained as they are in the U.S., providing us with an opportunity to observe the flipping behaviour of IPO subscribers in the absence of such constraints.

Our second motivation relates to the access of data on daily ownership records of investors in IPOs. These data come from Australian Stock Exchange Limited's (ASX) Clearing House Electronic Sub-register System (CHESS). CHESS records provide a unique data source allowing flipping behaviour to be studied across a broad cross-section of firms, industries and underwriters. CHESS records also allow us to investigate the daily ownership records of all CHESS-registered holders in an IPO, not just the subscribers to an IPO. In addition, we are able to improve on prior research by examining the significance of aftermarket purchasing by IPO investors who had previously flipped some or all of their allocation (i.e., reverse flipping). This has been ignored by extant literature. Finally, we are also able to test several unique hypotheses used to explain

[27] Of course these institutional owners may have other motivations for flipping these 'losers', such as crystallizing the loss for tax purposes, rebalancing of portfolios, or even to manage reported returns on a particular portfolio.

flipping behaviour, which are adapted from the realms of behavioural finance and IPO research and are applied to the IPO aftermarket.

We investigate the trading behaviour of all investors (initial subscribers and those who acquire shares in the aftermarket) in 419 Australian IPOs listed on ASX between December 1995 and December 2000. We investigate whether initial subscribers flip their allocations and we relate this flipping behaviour to issuer, shareholder, underwriter and market characteristics.

We define flipping as the liquidation of an IPO allocation during the first three days of initial trading. We find that flipping only accounts for a small proportion of aftermarket trading volume, with day trades comprising more than 50% of post-listing trading. Institutional investors are allocated significantly more of the IPOs we study, and there is a significant positive correlation between their allocations and underpricing of the IPO. While institutions seem to be able to identify IPOs that have good short run prospects, their allocations are unrelated to longer-term excess returns.

In our cross-sectional analysis we find strong support for underpricing (consistent with the disposition effect, i.e., a tendency to realise gains before losses), whether the IPO market is "hot" and ex ante risk characteristics as determinants of flipping behaviour. We also relate flipping activity to the firm's long-run return, and find that the flipping behaviour of large (informed) investors is unrelated to long-run returns, while uninformed investors consistently flip more of the IPOs that have better long-run returns. Uninformed investors simply "get it wrong". We also analyse the behaviour of institutional and individual IPO investors. Institutional investors are allocated a larger share of IPOs, and are shown to be more aggressive flippers of both underpriced and overpriced IPOs than are individuals. Institutional investors also flip more of the most overpriced issues that the less overpriced issues, a result inconsistent with the disposition effect. Evidence showing that share market participants are willing to come to terms with their losses is relatively rare, though it seems that institutional IPO subscribers are prepared to quit those IPOs that get the poorest initial market response.

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